Supporting your child's learning: Multiplication and Division in Years 3, 4, 5 and 6

Concrete - students should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.
Pictorial - students should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.
Abstract - with the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence.

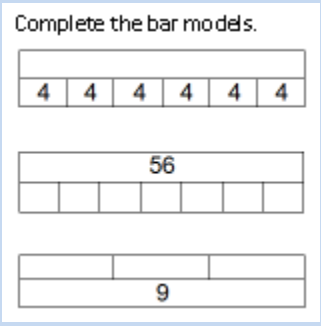
To master an area of Mathematics, all children need to be able to approach different types of problems.

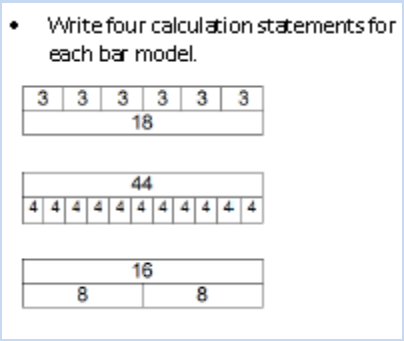
	Fluency	Reasoning	Problem Solving

Year 3

What is the relationship between these calculations?

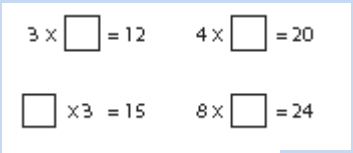
3 × 4
4 × 8
4 × 3
8 × 4

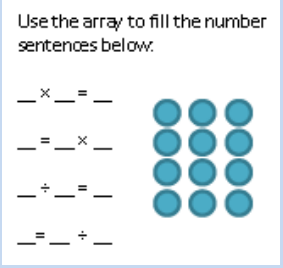




Use these 3 numbers to create multiplication and division statements

20 4 5





What do you notice about the following calculations?

3 × 4
3 × 8
4 × 4
4 × 8
3 × 5
3 × 10

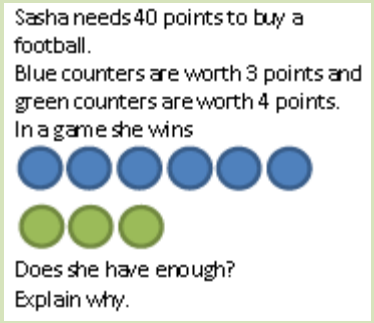
Tom says 'I can use my 3 times table to help me work out my 6 times table'. Is he correct? Convince me.

Start this rhythm, clap, clap, click, clap, clap, click.

Carry on the rhythm, what will you be doing on the 15th beat? How do you know? What will you be doing on the 20th beat? Explain and prove your answer.

Andy says 'I can use my four times table to work out 120 ÷ 4'. Show what Andy could do to work out this calculation.

4 ÷ 6 = 24
Do you agree? Explain.



What is the relationship between these calculations?

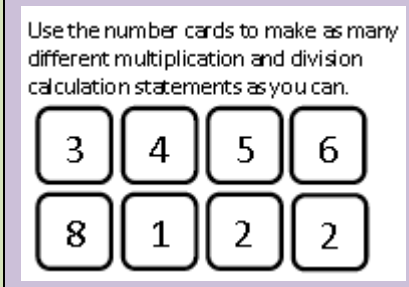
2 × 3 4 × 3
2 × 30 4 × 30
20 × 3 40 × 3
20 × 3 × 10 40 × 3 × 10

Megan has a box of apples that are in packs. Some packs have 3 apples in them, some packs have 6 apples in them. The box contains 64 apples. How many packs of 3 apples and how many packs of 6 apples could there be? Have you found all the possibilities?

Write these addition statements as multiplication statements:

2 + 2 + 2 + 2 + 4
3 + 3 + 3 + 2 + 4

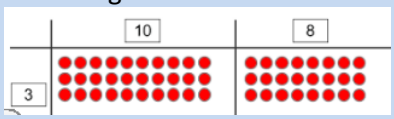
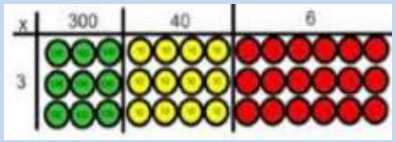
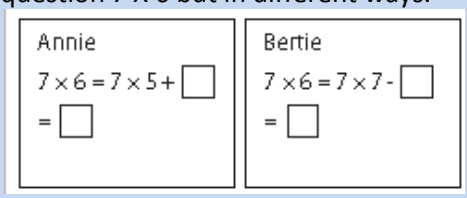
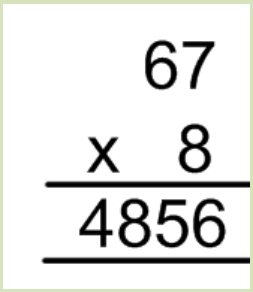
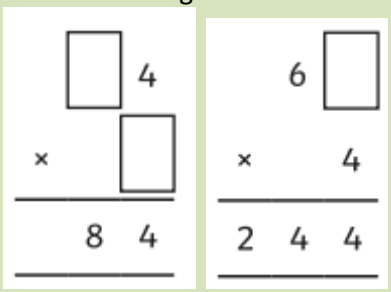
Roger has 96 patio slabs.
Using all of the slabs find three different ways that he can arrange the slabs to form a rectangular patio.



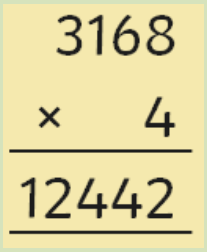
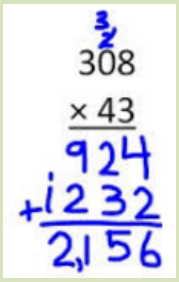
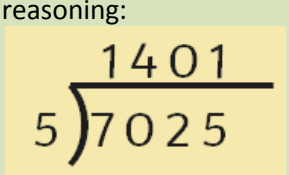
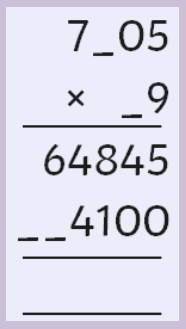
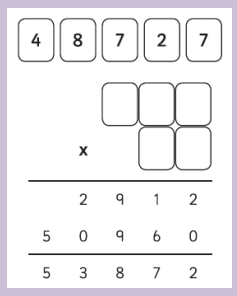
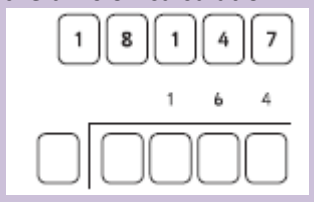
A green strip of paper is 3 cm long.
An orange strip of paper is 5 times as long.
How long is the orange strip?

	Fluency	Reasoning	Problem Solving

Year 4

Fluency	Reasoning	Problem Solving
Recall multiplication and division facts of multiplication tables up to 12 x 12: Calculate: 4 X 9 = 12 X 4 = Written multiplication methods: Write a multiplication calculation for each image:   Sophie has 6 packs of strawberries. There are 21strawberries in each pack. How many strawberries does Sophie have altogether? Solving problems: Annie and Bertie both solved the question 7 X 6 but in different ways.  Complete their methods then think of another way to solve the problem. Laura is making a sequence using shapes. She uses 2 circles, 3 pentagons and 4 rectangles. If she uses the same pattern to make a longer sequence, how many pentagons will she use in a sequence with 72 shapes altogether? Harry buys 8 packs of cards, one pack costs 62p. How much does Harry spend? a) Write a number sentence to represent the problem. b) Solve the problem.	Recall multiplication and division facts of multiplication tables up to 12 x 12: True or false? 4 X 6 = 2 X 2 X 3 2 X 3 X 4 = 7 X 8 Written multiplication methods: Francis says, “if you multiply a 2 digit number by a 2 digit number, your answer will always be a 3 digit number.” Do you agree? Explain. Find the mistake then find the correct answer.  Find the missing numbers:  Solving problems: Draw a bar model to show: Tom ate 9 grapes at the picnic. Sam ate 3 times as many grapes as Tom. How many grapes did they eat altogether? In a box there are red and yellow cubes. For every 6 red cubes there are 4 yellow cubes. Hannah says; If I have more than 12 red cubes, I will definitely have more than 10 yellow cubes. Do you agree? Explain.	Recall multiplication and division facts of multiplication tables up to 12 x 12: Find 3 possible solutions:  Written multiplication methods: Miss White orders some new whiteboard pens for Year 3 and 4. There are 126 children in Year 3 and 4. If she orders 6 boxes of 27 pens, will she have enough? Show your calculation. In one month, Charley read 624 pages of his books. His mum read 4 times as much as Charlie which was 173 pages more than Charlie’s dad. How many pages did they read altogether? Use a bar model to help. Solving problems: Multiply a number by itself and then make one factor one more and the other one less. What happens to the product? E.g. 4 × 4 = 16 6 × 6 = 36 5 × 3 = 15 7 × 5 = 35 What do you notice? Will this always happen? Sally has 9 times as many football cards as Sam. Together they have 150 cards. How many more cards does Sally have than Sam?

Year 5

Fluency	Reasoning	Problem Solving
Mental calculations: 7 x 9 = 63. Use this to help you find the answers to the number sentences: 63 ÷ 7 = 7 x 90 = Write down five multiplication and division facts that use the number 36. Multiply and divide whole numbers by 10, 100 and 1000: 562 X ? = 562000 ? ÷ 1000 = 5.67 Multiplication: Complete: 567 X 34 723 X 26 412 X 57 Division: Calculate: 435÷8 = 521 ÷6= Find the missing number: ? X 7 = 686 92 children are put in groups of 8 for a visit to a museum. How many groups are there? Explain what you do about the remainder when the answer is calculated. Square numbers, multiples, factors and prime numbers: Explain why 27 is not a prime number Explain how you would find the common factors of 48 and 75 4 squared =	Mental calculations: To multiply a number by 25 you multiply by 100 and then divide by 4. Use this strategy to solve. 94 x 25 4.2 x 25 10 times a number is 8340, what is 9 times the same number? Explain your working. Multiply and divide whole numbers by 10, 100 and 1000: Claire says; 'When you divide a number by 10 you just take away a nought and when you divide by 100 you take away two noughts.' Do you agree? Explain your answer. Multiplication: Spot the mistakes:   Division: Find the error and explain your reasoning:  Square numbers, multiples, factors and prime numbers: True or false? Explain. "12 x 25 = 300, so 300 is the common multiple of 12 and 25." Gail thinks that 6 squared is 36. Do you agree? Explain why.	Mental calculations: If 8 x 43 = 344, how many other pairs of numbers can you write that have the product of 344? Multiply and divide whole numbers by 10, 100 and 1000: David has £64,300 in his bank. He divides the amount by 100 and takes that much money out of the bank. Using the money he has taken out he spends £457 on furniture for his new house. How much money does David have left from the money he took out? Show your working. Multiplication:   Division: Use the digit cards to complete the division calculation:  Square numbers, multiples, factors and prime numbers: Clare's age is a multiple of 5 and 3 less than a multiple of 7. How old is Clare? How old will I need to be when my age is both a square number and a cubed number?

Year 6

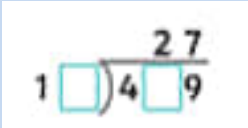
Division

4,748 people applied to be in a T.V. show audience. 43 people were invited to each show. How many shows did they make with full audiences and how many people were not invited? What is the closest amount to 43 that would have divided without a remainder?

Work out 6834 ÷ 31

Which calculation will give the largest answer?

1,764 ÷ 15
1,678 ÷ 13
845 ÷ 9



Multiplication:

330 × 24 =
340 × 23 =

Ellie planted 634 seeds. The packet showed each flower should have 14 petals. How many petals should there be altogether?

Problem solving:

It is correct that 273 × 32 = 8736. Use this fact to work out:
27·3 × 3·2
2·73 × 32 000
873·6 ÷ 0·32
87·36 ÷ 27·3
8736 ÷ 16
4368 ÷ 1·6

Division

Arvinder says:

"Without doing a written method, I know 6,012 ÷ 6 will not have a remainder"

Is he correct? How do you know?

Divide 3920 by:
8
16
24
32
What do you notice? Did you use the same strategy each time? Why?

Work out the missing digit.

31? × 7 = 2212

How did you find the answer?

Multiplication:

Mr Archibald estimates the following 5,999 x 30 = 180,000 Do you think he was right to that? Explain your reasons.

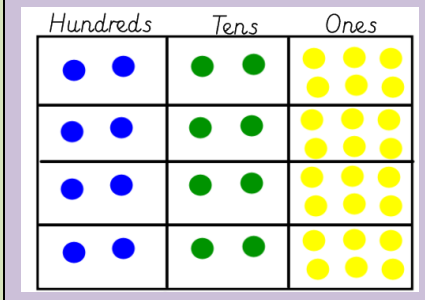
Problem solving:

Write true or false next to each statement. Explain your reasons for each answer.

632 × 6 gives the same answer as 6 × 632
3 × 321 = 321 + 321 + 321
10 × 10 × 10 x 7 = 30 × 7

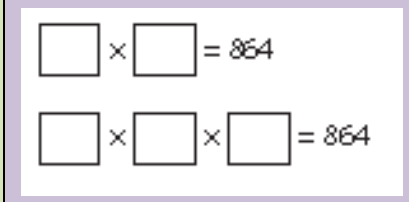
Division

A class were using place value counters to complete the calculation 226÷ 4. One child arranged her counters like this.



What mistake has she made? Can you show me how to do it correctly?

Multiplication:



Problem solving:

Which calculation would you prefer to answer and why?

(a) 52·4 ÷ 0·7 + 524 ÷ 7 **or** (b) 52·4 ÷ 0·7 – 524 ÷ 7